

Gunter, Jason

From: Seabourne, Rocky <rseabourne@doerun.com>
Sent: Friday, October 30, 2015 10:09 AM
To: 'brandon.wiles@dnr.mo.gov'; Gunter, Jason; Montgomery, Michael; Neaville, Chris; Ty Morris; Yingling, Mark
Subject: Emailing: Rivermines_ProgressReport_09-30, 8 - Remediation Air Report - August 2015, 2015-09-02 RM NPDES Pace Lab Report
Attachments: Rivermines_ProgressReport_09-30.pdf; 8 - Remediation Air Report - August 2015.pdf; 2015-09-02 RM NPDES Pace Lab Report.pdf

Your message is ready to be sent with the following file or link attachments:

Rivermines_ProgressReport_09-30
8 - Remediation Air Report - August 2015
2015-09-02 RM NPDES Pace Lab Report

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Rocky Seabourne
General Supervisor Land & Remediation
rseabourne@doerun.com

October 30, 2015

Mr. Jason Gunter Remedial Project Manager U.S. Environmental Protection Agency
Region 7 – Superfund Branch 11201 Renner Blvd.
Lenexa, KS 66219

RE: The Doe Run Company – Elvins/Rivermines Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 56 of the Unilateral Administrative Order (UAO) (CERCLA-07-2005-0169) for the referenced project and on behalf of The Doe Run Company, the progress report for the period of September 1, 2015 through September 30, 2015 is enclosed. If you have any questions or comments, please feel free to contact me at 573-244-8136.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rocky Seabourne', written in a cursive style.

Rocky Seabourne

General Supervisor Land & Remediation
c:Mark Yingling – TDRC (electronic only)
Chris Neaville – TDRC (electronic only)
Michael Montgomery - TDRC (electronic only)
Brandon Wiles – MDNR HWP
Ty Morris – Barr Engineering

Elvins/Rivermines Mine Tailings Site
Park Hills, Missouri
Removal Action - Monthly Progress Report
Period: September 1, 2015 – September 30, 2015

1. Actions performed or Completed This Period:
 - a. Work continued on the development of the Post-Removal Site Control Plan for the site.
 - b. Given the nature of the work remaining at the site, The Doe Run Company would like to request a reduction in the frequency of the progress reports to quarterly.
 - c. Monthly water samples were taken during the removal action activities. These samples have been continued since the completion of the removal action activities. The analytical results, which have been included in the progress reports, have shown little variation. As a result Doe Run would like to request a reduction in the frequency of the sampling to quarterly.
 - d. Started construction on Storm Water Management Plan.
 - e.
2. Analytical Data and Results Received This Period:
 - a. During this period, water samples were collected from just upstream of Old Missouri Highway 32, as well as from upstream and downstream of the confluence of the site discharge with Flat River. The analytical results for this event are included with this progress report.
 - b. During this period, the ambient air monitoring samples for August were processed and the Ambient Air Monitoring Report for June 2015 was completed and is attached.
3. Developments Anticipated and Work Schedule for Next Period:
 - a. Complete the water sampling activities.
 - b. Complete air monitoring activities as described in the Removal Action Work Plan.
 - c. Continue developing the Post-Removal Site Control Plan.
 - d. Continue work on Storm Water Management Plan.
4. Issues or Problems Encountered and the Resolution:
 - a. None.

Monthly Ambient Air Monitoring Report

The Doe Run Company
Old Lead Belt Sites:
Federal, Rivermines, National, and Leadwood

August-2015



SUITE 300
1801 PARK 270 DRIVE
ST. LOUIS, MO 63146

Federal Site

Sample Results for **August-2015**

Sample Date	St. Joe (Ballfields)		Big River#4		Water Treatment Plant	
	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3
8/3/15	29	0.014	36	0.021	36	0.056
8/5/15	14	0.007	15	0.007	14	0.007
8/6/15	22	0.007	20	0.007	24	0.007
8/7/15	invalid	invalid	20	0.007	20	0.007
8/10/15	invalid	invalid	16	0.007	17	0.028
8/11/15	invalid	invalid	19	0.007	20	0.007
8/12/15	23	0.027	19	0.007	33	0.062
8/13/15	invalid	invalid	25	0.013	29	0.048
8/14/15	invalid	invalid	invalid	invalid	invalid	invalid
8/17/15	invalid	invalid	19	0.007	22	0.007
8/18/15	invalid	invalid	15	0.007	8	0.000
8/19/15	48	0.007	13	0.000	14	0.007
8/20/15	invalid	invalid	invalid	invalid	invalid	invalid
8/21/15	26	0.000	20	0.007	18	0.007
8/24/15	24	0.021	13	0.014	21	0.055
8/25/15	invalid	invalid	invalid	invalid	invalid	invalid
8/26/15	30	0.028	25	0.027	33	0.027
8/27/15	invalid	invalid	20	0.040	16	0.007
8/28/15	26	0.007	24	0.013	23	0.014
8/31/15	37	0.007	31	0.007	29	0.007

Monthly Avg. TSP	28	21	22
Monthly Avg. Pb	0.012	0.012	0.021
Jul-15	0.007	0.008	0.014
Jun-15	0.011	0.009	0.017
Rolling 3-Month	0.010	0.010	0.017

Three month rolling average must be less than 0.15 ug/m3

Sample Date	Big River QA	
	TSP ug/m3	Lead ug/m3
8/4/15	14	0.007
8/6/15	16	0.007
8/11/15	16	0.007
8/13/15	invalid	invalid
8/18/15	16	0.007
8/20/15	18	0.014
8/25/15	20	0.007
8/27/15	invalid	invalid

Notes

A high rate of invalid samples were due to timer issues. An investigation into the problem was conducted on 9/27/15. We expect to see significant improvements going forward.

Rivermines

Sample Results for **August-2015**

	Big River #4		Rivermines South #1		Rivermines North #2		Rivermines East #3	
Sample Date	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3
8/3/15	36	0.021	invalid	invalid	25	0.007	36	0.056
8/5/15	15	0.007	invalid	invalid	13	0.000	14	0.007
8/6/15	20	0.007	32	0.091	19	0.007	24	0.007
8/7/15	20	0.007	invalid	invalid	20	0.007	20	0.007
8/10/15	16	0.007	18	0.021	15	0.007	17	0.028
8/11/15	19	0.007	invalid	invalid	16	0.007	20	0.007
8/12/15	19	0.007	23	0.102	15	0.007	33	0.062
8/13/15	25	0.013	invalid	invalid	19	0.007	29	0.048
8/14/15	invalid	invalid	invalid	invalid	invalid	invalid	invalid	invalid
8/17/15	19	0.007	18	0.007	19	0.021	22	0.007
8/18/15	15	0.007	18	0.007	20	0.021	8	0.000
8/19/15	13	0.000	invalid	invalid	10	0.000	14	0.007
8/20/15	invalid	invalid	21	0.022	invalid	invalid	invalid	invalid
8/21/15	20	0.007	invalid	invalid	14	0.007	18	0.007
8/24/15	13	0.014	45	0.096	18	0.042	21	0.055
8/25/15	invalid	invalid	invalid	invalid	invalid	invalid	invalid	invalid
8/26/15	25	0.027	74	0.291	24	0.028	33	0.027
8/27/15	20	0.040	27	0.033	14	0.007	16	0.007
8/28/15	24	0.013	invalid	invalid	20	0.014	23	0.014
8/31/15	31	0.007	29	0.007	25	0.014	29	0.007

Monthly Avg. TSP	21	30	18	22
Monthly Avg. Pb	0.012	0.068	0.012	0.021
Jul-15	0.008	0.053	0.013	0.014
Jun-15	0.009	0.049	0.033	0.011
Rolling 3-Month	0.009	0.057	0.019	0.015

Three month rolling average must be less than 0.15 ug/m3

	Big River QA	
Sample Date	TSP ug/m3	Lead ug/m3
8/4/15	14	0.007
8/6/15	16	0.007
8/11/15	16	0.007
8/13/15	invalid	invalid
8/18/15	16	0.007
8/20/15	18	0.014
8/25/15	20	0.007
8/27/15	invalid	invalid

Notes

A high rate of invalid samples were due to timer issues. An investigation into the problem was conducted on 9/27/15. We expect to see significant improvements going forward.

Federal Site

Sample Results for **August-2015**

Sample Date	St. Joe (Ballfields) PM10 (ug/m3)	Big River#4 PM10 (ug/m3)	Water Treatment PM10 (ug/m3)
8/1/15	43	17	89
8/4/15	16	44	15
8/7/15	17	17	19
8/10/15	invalid	invalid	invalid
8/13/15	invalid	invalid	23
8/16/15	invalid	22	invalid
8/19/15	15	9	12
8/22/15	invalid	invalid	invalid
8/25/15	invalid	invalid	invalid
8/28/15	invalid	invalid	invalid

Compliance with NAAQS is less than 150 ug/m3

Monthly Avg. PM10	23	22	32
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Sample Date	Big River QA PM10 (ug/m3)
8/4/15	31
8/10/15	32
8/16/15	16
8/22/15	invalid
8/28/15	22

Notes:

A high rate of invalid samples were due to timer issues. An investigation into the problem was conducted on 9/27/15. We expect to see significant improvements going forward.

Rivermines

Sample Results for **August-2015**

	Big River #4	Rivermines South #1	Rivermines North #2	Rivermines East #3
Sample Date	PM10 (ug/m3)	PM10 (ug/m3)	PM10 (ug/m3)	PM10 (ug/m3)
8/1/15	17	92	15	89
8/4/15	44	15	21	15
8/7/15	17	16	14	19
8/10/15	invalid	invalid	invalid	invalid
8/13/15	invalid	invalid	invalid	23
8/16/15	22	invalid	invalid	invalid
8/19/15	9	invalid	10	12
8/22/15	invalid	invalid	invalid	invalid
8/25/15	invalid	36	invalid	invalid
8/28/15	invalid	invalid	invalid	invalid

Compliance with NAAQS is less than 150 ug/m3

Monthly Avg. PM10	22	40	15	32
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	Big River QA
Sample Date	PM10 (ug/m3)
8/4/15	31
8/10/15	32
8/16/15	16
8/22/15	invalid
8/28/15	22

Notes:

A high rate of invalid samples were due to timer issues. An investigation into the problem was conducted on 9/27/15. We expect to see significant improvements going forward.

Meterological Data - Old Lead Belt

August-2015

24hr average

Date	Wind Speed (MPH)	Wind Direction	Sigma-Theta	Temperature (C)	Air Pressure (mmHg)	Rain (Inches)	Power Supply (Volts)
01-Aug-15	1.408	229.4	33.33	25.13	745	0	13.15
02-Aug-15	1.77	231.1	29.19	27.66	742	0	13.13
03-Aug-15	1.709	240	37.06	27.54	743	0	13.13
04-Aug-15	1.411	238.4	37.9	27.06	744	0	13.13
05-Aug-15	2.245	171.8	31.57	22.09	743	1.52	13.2
06-Aug-15	2.755	323.3	23.18	22.75	741	0	13.22
07-Aug-15	1.739	175.3	34.88	24.12	741	0	13.2
08-Aug-15	2.054	186.9	27.94	24.87	743	0	13.19
09-Aug-15	3.504	182.8	31.98	25.9	743	2.22	13.17
10-Aug-15	2.627	261.8	32.03	24.74	742	0.05	13.19
11-Aug-15	3.256	319.8	23.37	23.78	747	0	13.18
12-Aug-15	1.887	253	28.76	22.51	748	0	13.2
13-Aug-15	1.614	250.4	33.2	23.07	748	0	13.19
14-Aug-15	1.684	125.1	31.3	22.97	748	0	13.2
15-Aug-15	1.798	161.7	33.23	23.12	748	0	13.2
16-Aug-15	2.435	184.2	29.66	24.25	747	0	13.18
17-Aug-15	2.624	190.3	32.53	25.58	745	0	13.16
18-Aug-15	3.896	198.7	29.07	24.94	741	0.78	13.17
19-Aug-15	1.989	253.4	35.83	19.29	741	0.35	13.25
20-Aug-15	1.638	256.8	34.43	19.49	745	0	13.25
21-Aug-15	2.373	173.7	26.82	19.89	747	0	13.24
22-Aug-15	2.905	174.1	31.29	21.38	745	0.05	13.25
23-Aug-15	1.936	264.5	30.8	21.24	744	0	13.25
24-Aug-15	2.38	266.1	28.46	18.36	747	0	13.27
25-Aug-15	2.552	265.1	26.09	17.79	748	0	13.28
26-Aug-15	2.347	274.4	28.05	17.84	748	0	13.28
27-Aug-15	1.569	148.2	37.44	18.47	748	0	13.27
28-Aug-15	2.807	177.8	23.34	20.53	746	0	13.25
29-Aug-15	2.159	196.1	25.51	22.66	745	0	13.24
30-Aug-15	2.662	185	31.37	24.49	745	0.14	13.2
31-Aug-15	3.3	199.4	26.48	26.22	745	0	13.18

INQUEST
ENVIRONMENTAL INC.

3609 Mojave Ct., Ste E ♦ COLUMBIA, MO 65202
(573) 474-8110 ♦ FAX: (573) 474-8371

August 28, 2015

Mr. Greg Henson
Chemist
The Doe Run Company
881 Main Street
Herculaneum, Missouri 63048

RE: Park Hill Monitoring Network 3rd Quarter 2015 Lead/PM10 Samplers and
Meteorological System Performance Audit Report.

Dear Mr. Henson,

Please find enclosed the worksheets detailing the Lead/PM10 sampler's one-point flow verifications and meteorological sensors accuracy checks that were recently performed on the Doe Run Park Hills Monitoring Network. A copy of the current certifications for the audit devices that were used has also been enclosed.

All of the verifications and checks were found to be within expected guidelines.

After reviewing the enclosed information, please feel free to call with any comments or questions. Thank you for your business.

Sincerely,



John A. Kunkel
Inquest Environmental, Inc.

PM10 Sampler Verifications

INQUEST
Environmental, Inc.**PM10 Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Big River	Intercept (Qa)	-0.00876
Sampler	#4 Primary PM10	Temperature	28.3 °C 301.5 °K
Flow Controller	P2952	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.30	1.105	25.40	47.44	0.938	1.139	3.08	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
25.60	47.81	0.937	1.138	1.103	-2.39	± 10%

Calculations:Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST
Environmental, Inc.**PM10 Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Big River	Intercept (Qa)	-0.00876
Sampler	#4 QA PM10	Temperature	28.3 °C 301.5 °K
Flow Controller	P1019	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.40	1.121	27.10	50.61	0.934	1.147	2.32	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
27.10	50.61	0.934	1.147	1.120	-0.88	± 10%

Calculations:Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

Date	January 20, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	St Joe Park	Intercept (Qa)	-0.00876
Sampler	#4 PM10	Temperature	31.8 °C 305.0 °K
Flow Controller	P4353	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.10	1.077	24.90	46.50	0.939	1.136	5.48	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
24.90	46.50	0.939	1.136	1.074	-4.96	± 10%

Calculations:

Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST Environmental, Inc.

PM10 Sampler Audit Volumetric Flow Control

3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Wtr Plnt)	Intercept (Qa)	-0.00876
Sampler	#3 PM10	Temperature	31.8 °C 305.0 °K
Flow Controller	P2951	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.10	1.077	25.50	47.63	0.938	1.147	6.50	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
25.60	47.81	0.937	1.146	1.072	-5.13	± 10%

Calculations:

Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST Environmental, Inc.

PM10 Sampler Audit Volumetric Flow Control

3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Quarry)	Intercept (Qa)	-0.00876
Sampler	#1 PM10	Temperature	31.8 °C 305.0 °K
Flow Controller	P4601	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.30	1.111	24.60	45.94	0.940	1.121	0.90	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
24.50	45.76	0.940	1.121	1.111	-1.68	± 10%

Calculations:

Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST
Environmental, Inc.**PM10 Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Above Quarry)	Intercept (Qa)	-0.00876
Sampler	#2 PM10	Temperature	31.8 °C 305.0 °K
Flow Controller	P4507	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.30	1.111	26.00	48.56	0.936	1.136	2.25	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
26.10	48.75	0.936	1.136	1.110	-1.77	± 10%

Calculations:Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

Lead/TSP Sampler Verifications

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Big River Primary	Intercept (Qa)	-0.00876
Sampler	#4 TSP	Temperature	28.3 °C 301.5 °K
Flow Controller	P4557	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.85	1.193	23.90	44.65	0.942	1.239	3.86	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
23.00	42.97	0.944	1.242	1.194	1.10 - 1.70

Calculations:

Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Big River QA	Intercept (Qa)	-0.00876
Sampler	#4 TSP	Temperature	28.3 °C 301.5 °K
Flow Controller	P4558	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.90	1.200	23.10	43.16	0.944	1.237	3.08	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
23.10	43.16	0.944	1.237	1.199	1.10 - 1.70

Calculations:

Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

INQUEST
Environmental, Inc.**Lead Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	St Joe Park	Intercept (Qa)	-0.00876
Sampler	#4 TSP	Temperature	31.8 °C 305.0 °K
Flow Controller	P6792	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.70	1.176	22.60	42.22	0.945	1.242	5.61	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
22.90	42.78	0.944	1.241	1.171	1.10 - 1.70

Calculations:Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

INQUEST
Environmental, Inc.**Lead Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Water Plant)	Intercept (Qa)	-0.00876
Sampler	TSP	Temperature	31.8 °C 305.0 °K
Flow Controller	P4475	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.70	1.176	24.40	45.59	0.940	1.232	4.76	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
24.50	45.77	0.940	1.232	1.173	1.10 - 1.70

Calculations:Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

INQUEST
Environmental, Inc.**Lead Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Quarry)	Intercept (Qa)	-0.00876
Sampler	#1 TSP	Temperature	31.8 °C 305.0 °K
Flow Controller	P2940	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.60	1.160	23.70	44.28	0.942	1.240	6.90	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
23.20	43.35	0.943	1.241	1.155	1.10 - 1.70

Calculations:Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (above quarry)	Intercept (Qa)	-0.00876
Sampler	#1 TSP	Temperature	31.8 °C 305.0 °K
Flow Controller	P2941	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.70	1.176	23.20	43.35	0.943	1.243	5.70	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
22.90	42.78	0.944	1.244	1.173	1.10 - 1.70

Calculations:

Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

Calibration Orifice Certification Worksheet



TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVELAND, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5028A

Date - Jan 13, 2015 Rootmeter S/N 9833620 Ta (K) - 292
Operator Tisch Orifice I.D. - 1882 Pa (mm) - 765.81

PLATE OR VDC #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2C (in.)
1	NA	NA	1.00	1.3360	4.3	1.50
2	NA	NA	1.00	1.0560	6.8	2.50
3	NA	NA	1.00	0.9570	8.2	3.00
4	NA	NA	1.00	0.8870	9.5	3.50
5	NA	NA	1.00	0.6670	16.5	6.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
1.0225	0.7654	1.2420		0.9943	0.7443	0.7553
1.0191	0.9651	1.6034		0.9910	0.9385	0.9753
1.0173	1.0630	1.7564		0.9892	1.0337	1.0695
1.0155	1.1449	1.8972		0.9875	1.1133	1.1552
1.0061	1.5084	2.4840		0.9784	1.4668	1.5125
Qstd slope (m) = 1.66236				Qa slope (m) = 1.04094		
intercept (b) = -0.01438				intercept (b) = -0.00876		
coefficient (r) = 0.99927				coefficient (r) = 0.99927		
y axis = SQRT[H2O(Pa/760) (298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{ [SQRT(H2O(Pa/760) (298/Ta))] - b}
Qa = 1/m{ [SQRT H2O(Ta/Pa)] - b}

Meteorological Sensor's Accuracy Checks

Inquest Environmental, Inc.

Wind Direction Sensor Performance Audit

Operator The Doe Run Co.
 Location Big River
 Station Name Meteorological System
 Technician J Kunkel / M Kunkel

Date 07/29/2015
 Start Time 10:30
 Stop Time 11:30

Sensor Mfg RM Young
 Sensor Model Wind Monitor AQ
 Serial Number 128618
 Sensor Height 10.0 Meters

Station Declination 1.1 Deg
 Measured Angle 180.0 Deg
 Corrected Angle 181.1 Deg
 Alignment Error -1.1 Deg

Vane Angle	Data Logger	Results	
		Difference ± 3 Deg Limit	Total Error ± 5 Deg Limit
0/360	1.1	1.1	0.0
90	91.9	1.9	0.8
180	181.1	1.1	0.0
270	271.9	1.9	0.8

Average Difference (Degrees)	1.5
Average Total Error (Degrees)	0.4

Audit Device	Wind Vane Alignment	Direction
Type	Pocket Transit	Vane Angle Fixture
Mfg.	Brunton	R.M. Young
Model	5008	18212
Serial No.	5080304492	None

Comments: Wind direction was verified by determining the orientation of the sensor in respect to True North. This was measured using a tri-pod mounted transit aligned along the length of the sensor while locked from rotating. A magnetic declination of 1.1 degrees was used to determine True North. The linearity of the sensor was determined by aligning the sensor to an indexed test fixture provided by the manufacturer. The four cardinal directions were verified using the fixture. No adjustments were made to the sensor.

Inquest Environmental, Inc.

Wind Speed Sensor Performance Audit

Operator The Doe Run Co.
 Location Big River
 Station Name Meteorological System
 Auditor(s) J Kunkel / M Kunkel

Date 07/29/2015
 Start Time 10:30
 Stop Time 11:30

Sensor Mfg RM Young
 Sensor Model Wind Monitor AQ
 Serial Number 128618
 Sensor Height 10.0 Meters

Audit Standard		DAS Response		Limit
RPM	M/S	M/S	Difference	M/S
Zero	0.00	0.00	0.00	0.25
300	1.54	1.56	0.02	0.25
600	3.07	3.07	0.00	0.25
1200	6.14	6.15	0.01	0.56
1800	9.22	9.21	-0.01	0.71
3600	18.43	18.44	0.01	1.17
5400	27.65	27.63	-0.02	1.63
7200	36.86	36.85	-0.01	2.09
Average			0.00	

± (0.25 m/s + 5%)

Audit Device	Anemometer Drive
Type	Variable Speed
Mfg.	R.M. Young
Model	18801
Serial No.	CAO1631

Comments: Wind speed was verified using a variable speed anemometer drive. The propellor was removed from the sensor and the drive was connected using a flexible connector. The sensor was then rotated in the appropriate direction at several different speeds. Sensor responses were taken from the data logger. No adjustments were made to the sensor.

Inquest Environmental, Inc.

Temperature Sensor Performance Audit

Operator The Doe Run Co.
 Location Big River
 Station Name Meteorological System
 Technician J Kunkel / M Kunkel

Date 07/29/2015
 Start Time 10:30
 Stop Time 11:30

Sensor Information

Sensor Mfg Climatronics
 Sensor Model NA
 Serial Number NA
 Sensor Height 2 meters

Audit Device °C	Sensor	
	Data Logger °C	Difference °C
0.5	0.5	0.0
34.1	33.9	-0.2
44.0	43.9	-0.1
Average		-0.1

Note: The limit for each point is +/- 0.5 °C

Audit Device	
Type	Digital Thermometer
Mfg.	Control Company
Model	15-077-8
Serial No.	221381405

Comments: The temperature is verified by co-locating the sensor with a certified digital thermometer. The verification is conducted at three levels using two water baths (iced and hot water) and the ambient temperature. The sensor error was determined by comparing the sensor's data logger response to the display on the certified digital thermometer. No adjustments were made to the sensor.

Inquest Environmental, Inc.

Barometric Pressure Sensor Performance Audit

Operator The Doe Run Co.
 Location Big River
 Station Name Meteorological System
 Technician J Kunkel / M Kunkel

Date 07/29/2015
 Start Time 10:30
 Stop Time 11:30

Sensor Mfg Setra
 Sensor Model 276
 Serial Number 2626447

Audit Device	Data Logger Response	
	BP	Difference
mm HG	mm HG	mm HG
741.20	744.60	3.40

Note: Limit is +/- 7.5 mm HG.

Audit Device	
Type	Digital Barometer
Mfg.	AIR
Model	AIR-HB-1A
Serial No.	6G3745

Comments: The barometric pressure is verified by co-locating the sensor with a certified digital barometer. The verification was conducted at one level after allowing the sensor and calibration device ample time to stabilize. The sensor error was determined by comparing the sensor's data logger response to the display on the certified digital barometer. No adjustments were made to the sensor.

Inquest Environmental, Inc.

Precipitation Gauge Performance Audit

Operator The Doe Run Co
Location Big River
Station Name Meteorological System
Technician J Kunkel / M Kunkel

Date 07/29/2015
Start Time 10:30
Stop Time 11:30

Sensor Mfg Texas Electronics
Sensor Model TR525I
Serial Number 36611-805
Diameter (inches) 6.00

Audit Device	Data Logger Response	
	Gauge Tips	Difference %
Known Tips		
96.00	90.00	-6.25

Note: Limit is +/- 10%.

Audit Device	
Type	Graduated Beaker
Mfg.	Texas Instruments
Model	FC-525
Serial No.	NA

Comments: The precipitation gauge output was verified using a field calibration kit
supplied by the manufacturer. The kit consists of a graduated beaker
and a calibration funnel using a precision orifice at the water outlet.
Water was measured in the beaker and poured into the funnel while
mounted on the gauge. The amount of precipitation recorded by the
data logger was then compared to the known amount of water passing
through the funnel. 100 tips equals one inch of rainfall. The gauge
was cleaned and no adjustments were made.

Meteorological Audit Devices Certifications

BRUNTON OUTDOOR GROUP

CERTIFICATE OF CALIBRATION

Equipment Owner

Name: Inquest Environmental Mitch Kunkel
Address: 3609 Mojave Court, Ste E
Columbia, MO 65207

Calibration traceable to the National Institute of Standards and Technology in accordance with MIL-STD-45662A has been accomplished on the instrument listed below by comparison with standards maintained by the Brunton Outdoor Group. The accuracy and stability of all standards maintained by the Brunton Outdoor Group are traceable to national standards maintained by the National Institute of Standards and Technology in Washington, D.C. and Boulder, CO. Completed record of all work performed is maintained by the Brunton Outdoor Group and is available for inspection upon request.

This unit has been calibrated to Lietz TM10E serial number 30937 traceable to N.B.S. Number 738227675 this July Day 30 20 14.

Description Pocket Transit

Purchase Order 256430329

Order Number 50-070367

Model Number F-5008

Serial Number 5080304492

Calibration Date 7/30/14

Recalibration Date 7/30/15

Signed Eddie Appleby 7/30/14

Quality Control Coordinator



CALIBRATION PROCEDURE
18801/18810 ANEMOMETER DRIVE

DWG: CP18801(A)

REV: C101107

PAGE: 2 of 4

BY: TJT

DATE: 10/11/07

CHK: JC

W.C. GAS-12

CERTIFICATE OF CALIBRATION AND TESTING

MODEL: 18801 (Comprised of Models 18820 Control Unit & 18830 Motor Assembly)
SERIAL NUMBER: CA01631

R. M. Young Company certifies that the above equipment was inspected and calibrated prior to shipment in accordance with established manufacturing and testing procedures. Standards established by R.M. Young Company for calibrating the measuring and test equipment used in controlling product quality are traceable to the National Institute of Standards and Technology.

Nominal Motor Rpm	Output Frequency Hz (1)	Calculated Rpm (2)	Indicated Rpm (3)
600	320	600	600
1200	640	1200	1200
2400	1280	2400	2400
4200	2240	4200	4200
6,000	3200	6000	6000
8,100	4320	8100	8100
9,900	5280	9900	9900
<input checked="" type="checkbox"/> Clockwise and Counterclockwise rotation verified			

- (1) Measured at the optical encoder output.
(2) Frequency output produces 32 pulses per revolution of motor shaft.
(3) Indicated on the Control Unit LCD display.

* Indicates out of tolerance

☒ No Calibration Adjustments Required

☐ As Found

☐ As Left

Traceable frequency meter used in calibration Model: DP5740 SN: 4863

Date of inspection 10 Dec 2014
Inspection Interval One Year

Tested By EC



Calibration
Certificate No. 1750.01

Calibration complies with ISO/IEC
17025, ANSI/NCSL Z540-1, and 9001



Cert. No.: 4000-6726396

Traceable® Certificate of Calibration for Digital Thermometer

Cust ID: Inquest Environmental Inc., 3609 Mojave Court, Suite E, Columbia, MO 65202 U.S.A. (RMA:995292)

Instrument Identification:

Model Numbers: 15-077-8, 11705843 S/N: 221381404 Manufacturer: Control Company
Model: 15-077-7 S/N: 51202300

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC-179	A45240		
Thermistor Module	A17118	3/03/16	1000371058
Temperature Probe	3039	4/02/16	15-A0P2S-20-1
Temperature Calibration Bath TC-231	A79341		
Thermistor Module	A27129	11/04/15	1000365407
Temperature Probe	5202	11/19/16	6-CV9Y2-1-1
Temperature Calibration Bath TC-309	B3A444		
Thermistor Module	A27129	11/04/15	1000365407
Temperature Probe	5267	11/19/16	6-CV9Y0-1-1

Certificate Information:

Technician: 68 Procedure: CAL-06 Cal Date: 4/28/15 Due Date: 4/28/16
Test Conditions: 22.4°C 47.0 %RH 1012 mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C	-0.001	0.011	Y	-0.001	-0.001	Y	-0.051	0.049	0.013	3.8:1
°C	24.999	24.999	Y	24.999	25.000	Y	24.949	25.049	0.014	3.6:1
°C	60.003	60.007	Y	60.003	60.001	Y	59.953	60.053	0.014	3.6:1
°C	100.000	100.012	Y	100.000	100.004	Y	99.950	100.050	0.014	3.6:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Nicol Rodriguez
Nicol Rodriguez, Quality Manager

Aaron Judice
Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Thermometers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-2008-AQ-HOU-RvA
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).



HASS INSTRUMENT CORPORATION

6711 OLD BRANCH AVENUE • CAMP SPRINGS, MD 20748-6990 • (301) 449-5454 • FAX (301) 449-5455

CALIBRATION REPORT

BAROMETER/ALTIMETER
AIR Model AIR-HB-1A
Serial No. 6G3745

<u>TEST POINT</u>	<u>TEST PRESSURE</u>	<u>DIGITAL READOUT</u>	<u>READOUT ERROR</u>	<u>CORRECTION REQUIRED</u>
1	930.00	931.9	+1.9	-1.9
2	970.00	971.9	+1.9	-1.9
3	1010.00	1011.9	+1.9	-1.9
4	1050.00	1051.9	+1.9	-1.9
5	1011.97	1013.9	+1.9	-1.9

NOTES:

1. All data are in Millibars (hPa) and were taken at 70 F (21 C).
2. To correct the Digital Readout of the instrument, either algebraically add the CORRECTION REQUIRED to, or algebraically subtract the READOUT ERROR from, the readout shown on the instrument.
3. The TEST PRESSURE was generated using Type A-1 Barometer S/N 3327, and was approached in an increasing-pressure direction.
4. The TEST PRESSURE for TEST POINT 5 was ambient atmospheric pressure.
5. The BAROMETER/ALTIMETER was horizontal during the calibration.
6. The LCD screen of the BAROMETER/ALTIMETER has some trash in the center of the display, but it does not interfere with the readout.
7. Although the Digital Readout of the instrument can be adjusted to incorporate the average CORRECTION REQUIRED, this has not been done.

Calibration Date: 10 March 2015

By: Bernard I. Hass

(SEAL)

Bernard I. Hass



Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

September 10, 2015

Amy Sanders
The Doe Run Company
P. O. Box 500
Viburnum, MO 65566

RE: Project: NPDES (RIVERMINES)
Pace Project No.: 60201957

Dear Amy Sanders:

Enclosed are the analytical results for sample(s) received by the laboratory on September 03, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc..



Pace Analytical Services, Inc.

9608 Loiret Blvd.

Lenexa, KS 66219

(913)599-5665

CERTIFICATIONS

Project: NPDES (RIVERMINES)

Pace Project No.: 60201957

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NPDES (RIVERMINES)

Pace Project No.: 60201957

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60201957001	36824/RIVERMINES DOWNSTREAM	Water	09/02/15 11:42	09/03/15 08:30
60201957002	36825/RIVERMINES UPSTREAM	Water	09/02/15 12:13	09/03/15 08:30
60201957003	36826/RIVERMINES 001	Water	09/02/15 11:53	09/03/15 08:30

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Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: NPDES (RIVERMINES)
Pace Project No.: 60201957

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60201957001	36824/RIVERMINES DOWNSTREAM	EPA 200.7	SMW	6	PASI-K
		EPA 200.7	SMW	3	PASI-K
		SM 2540D	CRT	1	PASI-K
		EPA 300.0	AJM	1	PASI-K
60201957002	36825/RIVERMINES UPSTREAM	EPA 200.7	SMW	6	PASI-K
		EPA 200.7	SMW	3	PASI-K
		SM 2540D	CRT	1	PASI-K
		EPA 300.0	AJM	1	PASI-K
60201957003	36826/RIVERMINES 001	EPA 200.7	SMW	3	PASI-K
		SM 2540D	CRT	1	PASI-K
		SM 2540F	JMC1	1	PASI-K
		EPA 300.0	AJM	1	PASI-K

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ANALYTICAL RESULTS

Project: NPDES (RIVERMINES)

Pace Project No.: 60201957

Sample: 36824/RIVERMINES
DOWNSTREAM **Lab ID:** 60201957001 **Collected:** 09/02/15 11:42 **Received:** 09/03/15 08:30 **Matrix:** Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium	7.2	ug/L	5.0	0.56	1	09/04/15 10:00	09/04/15 16:09	7440-43-9	
Calcium	140000	ug/L	100	5.2	1	09/04/15 10:00	09/04/15 16:09	7440-70-2	
Lead	11.0	ug/L	5.0	1.9	1	09/04/15 10:00	09/04/15 16:09	7439-92-1	
Magnesium	43400	ug/L	50.0	13.3	1	09/04/15 10:00	09/04/15 16:09	7439-95-4	
Total Hardness by 2340B	528000	ug/L	500		1	09/04/15 10:00	09/04/15 16:09		
Zinc	5070	ug/L	50.0	2.6	1	09/04/15 10:00	09/04/15 16:09	7440-66-6	
200.7 Metals, Dissolved (LF) Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium, Dissolved	6.5	ug/L	5.0	0.56	1	09/04/15 10:00	09/04/15 17:08	7440-43-9	B
Lead, Dissolved	6.7	ug/L	5.0	1.9	1	09/04/15 10:00	09/04/15 17:08	7439-92-1	
Zinc, Dissolved	4760	ug/L	50.0	2.6	1	09/04/15 10:00	09/04/15 17:08	7440-66-6	
2540D Total Suspended Solids Analytical Method: SM 2540D									
Total Suspended Solids	6.0	mg/L	5.0	5.0	1		09/09/15 11:21		
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Sulfate	348	mg/L	20.0	4.7	20		09/09/15 00:10	14808-79-8	

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ANALYTICAL RESULTS

Project: NPDES (RIVERMINES)

Pace Project No.: 60201957

Sample: 36825/RIVERMINES **Lab ID:** 60201957002 **Collected:** 09/02/15 12:13 **Received:** 09/03/15 08:30 **Matrix:** Water
UPSTREAM

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium	ND	ug/L	5.0	0.56	1	09/04/15 10:00	09/04/15 16:13	7440-43-9	
Calcium	43100	ug/L	100	5.2	1	09/04/15 10:00	09/04/15 16:13	7440-70-2	
Lead	6.0	ug/L	5.0	1.9	1	09/04/15 10:00	09/04/15 16:13	7439-92-1	
Magnesium	26800	ug/L	50.0	13.3	1	09/04/15 10:00	09/04/15 16:13	7439-95-4	
Total Hardness by 2340B	218000	ug/L	500		1	09/04/15 10:00	09/04/15 16:13		
Zinc	11.7J	ug/L	50.0	2.6	1	09/04/15 10:00	09/04/15 16:13	7440-66-6	
200.7 Metals, Dissolved (LF) Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium, Dissolved	ND	ug/L	5.0	0.56	1	09/04/15 10:00	09/04/15 17:19	7440-43-9	
Lead, Dissolved	ND	ug/L	5.0	1.9	1	09/04/15 10:00	09/04/15 17:19	7439-92-1	
Zinc, Dissolved	6.8J	ug/L	50.0	2.6	1	09/04/15 10:00	09/04/15 17:19	7440-66-6	
2540D Total Suspended Solids Analytical Method: SM 2540D									
Total Suspended Solids	9.0	mg/L	5.0	5.0	1		09/09/15 11:22		
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Sulfate	21.8	mg/L	2.0	0.47	2		09/09/15 00:23	14808-79-8	

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ANALYTICAL RESULTS

Project: NPDES (RIVERMINES)
Pace Project No.: 60201957

Sample: 36826/RIVERMINES 001 Lab ID: 60201957003 Collected: 09/02/15 11:53 Received: 09/03/15 08:30 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium	31.0	ug/L	5.0	0.56	1	09/04/15 10:00	09/04/15 16:16	7440-43-9	
Lead	64.4	ug/L	5.0	1.9	1	09/04/15 10:00	09/04/15 16:16	7439-92-1	
Zinc	22900	ug/L	50.0	2.6	1	09/04/15 10:00	09/04/15 16:16	7440-66-6	
2540D Total Suspended Solids Analytical Method: SM 2540D									
Total Suspended Solids	6.0	mg/L	5.0	5.0	1		09/09/15 11:22		
2540F Total Settleable Solids Analytical Method: SM 2540F									
Total Settleable Solids	ND	mL/L/hr	0.20	0.20	1		09/04/15 08:50		
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Sulfate	851	mg/L	100	23.7	100		09/09/15 00:37	14808-79-8	

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QUALITY CONTROL DATA

Project: NPDES (RIVERMINES)

Pace Project No.: 60201957

QC Batch: MPRP/33069

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60201957001, 60201957002, 60201957003

METHOD BLANK: 1627885

Matrix: Water

Associated Lab Samples: 60201957001, 60201957002, 60201957003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cadmium	ug/L	ND	5.0	09/04/15 15:24	
Calcium	ug/L	27.8J	100	09/04/15 15:24	
Lead	ug/L	ND	5.0	09/04/15 15:24	
Magnesium	ug/L	ND	50.0	09/04/15 15:24	
Total Hardness by 2340B	ug/L	ND	500	09/04/15 15:24	
Zinc	ug/L	ND	50.0	09/04/15 15:24	

LABORATORY CONTROL SAMPLE: 1627886

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cadmium	ug/L	1000	968	97	85-115	
Calcium	ug/L	10000	9580	96	85-115	
Lead	ug/L	1000	971	97	85-115	
Magnesium	ug/L	10000	9400	94	85-115	
Total Hardness by 2340B	ug/L		62600			
Zinc	ug/L	1000	949	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1627887 1627888

Parameter	Units	60201956001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Cadmium	ug/L	ND	1000	1000	983	976	98	98	70-130	1	20
Calcium	ug/L	49300	10000	10000	58600	57300	93	80	70-130	2	20
Lead	ug/L	3.1J	1000	1000	965	961	96	96	70-130	0	20
Magnesium	ug/L	28200	10000	10000	37500	37000	93	88	70-130	1	20
Total Hardness by 2340B	ug/L	239000			301000	295000				2	
Zinc	ug/L	31.4J	1000	1000	978	974	95	94	70-130	1	20

MATRIX SPIKE SAMPLE: 1627889

Parameter	Units	60201956002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cadmium	ug/L	1.2J	1000	969	97	70-130	
Calcium	ug/L	43300	10000	52700	95	70-130	
Lead	ug/L	ND	1000	956	95	70-130	
Magnesium	ug/L	25600	10000	35200	97	70-130	
Total Hardness by 2340B	ug/L	213000		277000			
Zinc	ug/L	ND	1000	937	93	70-130	

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QUALITY CONTROL DATA

Project: NPDES (RIVERMINES)

Pace Project No.: 60201957

QC Batch: MPRP/33065

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 60201957001, 60201957002

METHOD BLANK: 1627871

Matrix: Water

Associated Lab Samples: 60201957001, 60201957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cadmium, Dissolved	ug/L	0.86J	5.0	09/04/15 16:46	
Lead, Dissolved	ug/L	ND	5.0	09/04/15 16:46	
Zinc, Dissolved	ug/L	ND	50.0	09/04/15 16:46	

LABORATORY CONTROL SAMPLE: 1627872

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cadmium, Dissolved	ug/L	1000	985	99	85-115	
Lead, Dissolved	ug/L	1000	1000	100	85-115	
Zinc, Dissolved	ug/L	1000	968	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1627873 1627874

Parameter	Units	60201956001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium, Dissolved	ug/L	ND	1000	1000	963	962	96	96	70-130	0	20	
Lead, Dissolved	ug/L	ND	1000	1000	977	976	98	98	70-130	0	20	
Zinc, Dissolved	ug/L	25.5J	1000	1000	968	969	94	94	70-130	0	20	

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QUALITY CONTROL DATA

Project: NPDES (RIVERMINES)

Pace Project No.: 60201957

QC Batch: WET/57057

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 60201957001, 60201957002, 60201957003

METHOD BLANK: 1629624

Matrix: Water

Associated Lab Samples: 60201957001, 60201957002, 60201957003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	09/09/15 09:48	

SAMPLE DUPLICATE: 1629625

Parameter	Units	60201956001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

SAMPLE DUPLICATE: 1629626

Parameter	Units	60201975002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	18.0	22.0	20	10	D6

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QUALITY CONTROL DATA

Project: NPDES (RIVERMINES)

Pace Project No.: 60201957

QC Batch: WETA/35800

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60201957001, 60201957002, 60201957003

METHOD BLANK: 1629101

Matrix: Water

Associated Lab Samples: 60201957001, 60201957002, 60201957003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	09/08/15 13:18	

LABORATORY CONTROL SAMPLE: 1629102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1629103 1629104

Parameter	Units	60201976001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	1580	1000	1000	2510	2490	93	91	80-120	1	15	

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QUALIFIERS

Project: NPDES (RIVERMINES)
Pace Project No.: 60201957

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.
D6 The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NPDES (RIVERMINES)
Pace Project No.: 60201957

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60201957001	36824/RIVERMINES DOWNSTREAM	EPA 200.7	MPRP/33069	EPA 200.7	ICP/24401
60201957002	36825/RIVERMINES UPSTREAM	EPA 200.7	MPRP/33069	EPA 200.7	ICP/24401
60201957003	36826/RIVERMINES 001	EPA 200.7	MPRP/33069	EPA 200.7	ICP/24401
60201957001	36824/RIVERMINES DOWNSTREAM	EPA 200.7	MPRP/33065	EPA 200.7	ICP/24397
60201957002	36825/RIVERMINES UPSTREAM	EPA 200.7	MPRP/33065	EPA 200.7	ICP/24397
60201957001	36824/RIVERMINES DOWNSTREAM	SM 2540D	WET/57057		
60201957002	36825/RIVERMINES UPSTREAM	SM 2540D	WET/57057		
60201957003	36826/RIVERMINES 001	SM 2540D	WET/57057		
60201957003	36826/RIVERMINES 001	SM 2540F	WET/56986		
60201957001	36824/RIVERMINES DOWNSTREAM	EPA 300.0	WETA/35800		
60201957002	36825/RIVERMINES UPSTREAM	EPA 300.0	WETA/35800		
60201957003	36826/RIVERMINES 001	EPA 300.0	WETA/35800		

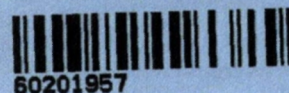
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Sample Condition Upon Receipt

WO#: 60201957



60201957

Client Name: DRC

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 7744 2158 2714 Pace Shipping Label Used? Yes ☐ No ☐

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: CF +0.8 T-239 / CF +0.8 T-262 Type of Ice: Wet Blue ☐ None ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 1.0

Date and initials of person examining contents: 9/3/15

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>Sett Sol</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Includes date/time/ID/analyses Matrix: <u>WT</u>		13.
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed
Trip Blank present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Lot # of added preservative
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17. List State:
Additional labels attached to 5035A vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	18.

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____

Date: 9/3/15

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Required Client Information:

Required Project Information:

Invoice Information:

Company: The Doe Run Company		Report To: Amy Sanders	Attention: Amy Sanders	REGULATORY AGENCY		Page: 1 of 1
Address: PO Box 500		Copy To:	Company Name: The Doe Run Company			
Email To: asanders@doerun.com		Purchase Order No.:	Address: PO Box 500, Viburnum, MO 65566	<input type="checkbox"/> NPDES	<input type="checkbox"/> GROUND WATER	COC#: 2587
Phone: (573) 689-4535	Fax: (573) 244-8179	Project Name: NPDES (Rivermines)	Pace Quote Reference:	<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	
Requested Due Date/TAT: 5 To 7 Days	Project Number:	Pace Project Manager:	Pace Profile #:	Site Location	MO	
				STATE:		

[illegible]**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER:

Larry Hopkins

SIGNATURE of SAMPLER:

DATE Signed
(MM/DD/YY):

9/2/15

Temp in °C

pH in SU

Received on

Custody	ICE (I/M)
---------	-----------

**Custody
Sealed Cooler
1000**